

# PATENT ABSTRACTS OF JAPAN

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## (54) PRODUCTION OF ADHESIVE SHEET

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a method for producing an adhesive sheet having excellent adhesivity between an olefinic substrate and an adhesive mass layer, capable of simplifying facilities and improving production efficiency by omitting a part of a conventional production processes.

**SOLUTION:** An adhesive mass comprising an olefinic resin and an uncrosslinked thermoplastic resin is co-extrusion molded to one side of a release paper so that the adhesive mass exists at the release paper side and a colored coating film is laminated to the surface of the olefinic resin layer. An olefinic substrate resin having cutting properties, flexibility and strength required for a marking sheet can be used as the olefinic substrate resin. For example, a polyethylene, a polypropylene, a copolymer of ethylene and propylene, or the like, may be cited as the resin. Especially, a polyethylene and a polypropylene having the same flexibility as that of vinyl chloride resin and low crystallizability and a blend of a copolymer of propylene and ethylene having excellent stress relaxation as that of vinyl chloride are preferable as the resin.

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**CLAIMS**

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[Claim(s)]

[Claim 1]A manufacturing method of a pressure sensitive adhesive sheet characterized by laminating a color coating film on the surface of an olefin system resin layer after carrying out co-extrusion molding of the binder which consists of olefin system resin and thermoplastics unconstructed a bridge to the whole surface of a release paper so that a binder may become the release paper side.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the manufacturing method of the pressure sensitive adhesive sheet used for the outdoors and indoor advertisement or the stickers for a display.

[0002]

[Description of the Prior Art]The marking sheet which clips and sticks on a pattern or a character the pressure sensitive adhesive sheet which used as the substrate the vinyl chloride resin sheet colored instead of the conventional paint as the signboard used outdoors etc. or an advertisement is used. Many of such pressure sensitive adhesive sheets cast coloring vinyl-chloride-resin sol on a process paper, or they fabricate a sheet with a calendar, and are manufactured by laminating an adhesive layer and a release paper to this.

[0003]In order to cast vinyl-chloride-resin sol and to produce a sheet, desiccation, the process of carrying out a cure, and the laminating process of an adhesive layer are required in the cast sol, and the laminating process of an adhesive layer is required also of the sheet forming by a calendar. The consciousness about the environmental problem produced by the discarding treatment after use increases, and demineralization-ized vinylation is demanded in recent years.

[0004]then, as what is replaced with vinyl chloride resin of a substrate, the applicant has proposed the pressure sensitive adhesive sheet in which the ink absorbing layer, on the other hand, resembled the whole surface of the olefin system resin base material sheet, and the adhesive layer was laminated. This pressure sensitive adhesive sheet carries out extrusion molding of the olefin system resin by a T die, produces a sheet, and it is obtained by laminating the adhesive layer which carried out spreading desiccation and formed the acrylic-pressure-sensitive-adhesive solution in the release paper separately on the above-mentioned sheet.

[0005]However, there is a problem that the process of laminating the formed adhesive layer once fabricating a sheet is required for manufacture of this pressure sensitive adhesive sheet, and enlargement of equipment and production efficiency are low. since olefin system resin is low polar, it is inferior to adhesion with an adhesive layer, and it also has the problem that it is alike occasionally, it carries out and exfoliation with an adhesive layer arises.

[0006]

[Problem(s) to be Solved by the Invention]By skipping a part of conventional manufacturing process, this invention raises the simplification of equipment, and the rate of productivity, and it aims at providing the manufacturing method of the pressure sensitive adhesive sheet excellent in the adhesion of an olefin system

substrate and an adhesive layer.

[0007]

[Means for Solving the Problem]A manufacturing method of a pressure sensitive adhesive sheet of this invention laminates a color coating film on the surface of an olefin system resin layer, after carrying out co-extrusion molding of the binder which consists of olefin system resin and thermoplastics unconstructed a bridge to the whole surface of a release paper so that a binder may become the release paper side.

[0008]As olefin system base material resin used by this invention, it has cutting nature, pliability, and intensity which are required of a marking sheet, and a copolymer of polyethylene, polypropylene, and ethylene and propylene, etc. should just be mentioned. What blended especially a copolymer of VCM/PVC, low crystalline polyethylene and polypropylene which have pliability similarly, and propylene which was excellent in stress relaxation nature like VCM/PVC, and ethylene is preferred.

[0009]Thermoplastics unconstructed a bridge is adhesive in itself, if it has the mobility in which extrusion molding is possible with an extrusion machine, there will be no limitation in particular, but adhesive materials in which a double bond was removed by hydrogenation like SEBS, such as a rubber system and acrylic, are preferred, in view of weatherability needed or adhesion characteristics.

[0010]By carrying out co-extrusion molding of olefin system resin and the thermoplastics unconstructed a bridge, it can be considered as a layered product which both stuck firmly.

[0011]As for a release paper, detachability with the above-mentioned thermoplastics should just be stabilized, and it can use that by which coat paper, a polyethylene laminated paper, a PET film, etc. were coated with silicone series resin or fluoro-resin.

[0012]A paint makes a function of a marking sheet reveal and what has the olefin system resin surface which is a substrate, and good adhesion is used. As such a paint, there are what forms a coat by desiccation or hardening, and a 2 liquid hardening type thing with 1 liquid types, such as acrylic, a urethane system, a melamine system, and a polyester system, and paints currently used [ various ] widely, such as a drainage system and oiliness, can be used, respectively.

[0013]In order to carry out coating of the paint to the olefin system resin layer surface which is a substrate uniformly, it is preferred that wettability with a base material surface uses a paint of a good solvent system. An acrylic urethane system and a melamine system paint which are used for a car, building materials, etc. to a use as which weatherability is required are preferred. When advanced weatherability is required, use of inorganic system calcination paints, a silicone series, and fluoro-resin is preferred.

[0014]In order to raise the adhesion of a paint and an olefin system resin base material, it is preferred to carry out ground treatment by corona discharge treatment, a flame process, chlorinated polypropylene, etc., etc. to a base material surface, and the coating of a paint can adopt arbitrary methods, such as a spray coat and a roll coat.

[0015]

[Embodiment of the Invention]The example of this invention is described below.

(Example 1) As olefin system resin, rutile type titanium dioxide masterbatch (60 % of the weight of paints content) 20 weight section was blended with low-density-polyethylene (Mitsubishi Chemical make, trade name "LC500") 100 weight section as a white pigment. As thermoplastics unconstructed a bridge, tackifier (Arakawa chemicals company make, trade name "Al Cong P70") 50 weight section was blended with SEBS(Asahi Chemical Co., Ltd. make, trade name "tough tech")100 weight section. The thermoplastic resin layer side was

laminated in the release paper on a cooling roller, carrying out co-extrusion molding of the above-mentioned low density polyethylene and the thermoplastics from a T die so that it may become the thickness whose polyethylene layer is 60 micrometers and whose thermoplastic resin layer is 25 micrometers with a two-layer co-extrusion-molding machine, and this was once rolled round. Next, perform corona discharge treatment on the polyethylene layer surface, and acrylic lacquer (it is an isocyanate system hardening agent (Japanese polyurethane company make, thing which carried out trade name "coronate 2094" 10 weight-section combination) to the Dai Nippon Toryo Co., Ltd. make and trade name "auto V top monarch blue" 100 weight section) is applied to it, It was made to harden and the coating layer was formed.

[0016](Comparative example 1) Extrusion molding of the same low density polyethylene as what was used in Example 1 was carried out from the T die, and it was considered as the 60-micrometer-thick polyethylene sheet. SEBS(Asahi Chemical Co., Ltd. make, trade name "tough tech")100 weight section and tackifier (Arakawa chemicals company make, trade name "Al Cong P70") 50 weight section were dissolved in toluene 850 weight section, spreading desiccation of this was carried out at the release paper, and the adhesive layer was formed. Corona discharge treatment was carried out to the whole surface of the above-mentioned polyethylene sheet, and the above-mentioned adhesive layer was laminated and rolled round to this treated surface. Carried out corona discharge treatment to other fields of the polyethylene sheet, this field was made to apply and harden the same acrylic lacquer as Example 1, and the coating layer was formed.

[0017](Comparative example 2) Although corona discharge treatment was not performed on the polyethylene sheet surface which laminates an adhesive layer but spreading desiccation of the toluene solution of the binder used by the comparative example 1 was carried out directly in this field, wrinkles occurred with the heat at the time of desiccation, and the pressure sensitive adhesive sheet was not obtained.

[0018](Comparative example 3) The pressure sensitive adhesive sheet which has a coating layer like the comparative example 1 was obtained except not having carried out corona discharge treatment to the polyethylene sheet side which laminates an adhesive layer.

[0019]The item shown in Table 1 about the pressure sensitive adhesive sheet of Example 1 and the comparative examples 1-3 estimated, and the result was shown in Table 1.

[0020]

[Table 1]

	外観	剥離性	貼付性	工程	製造効率	溶剤使用量	糊残り
実施例 1	良好	良好	良好	短い	高い	少ない	○
比較例 1	良好	良好	良好	長い	低い	多い	×
比較例 2	—	—	—	—	—	—	—
比較例 3	良好	良好	良好	長い	低い	多い	×

\* In order to evaluate the adhesion of a polyethylene layer and an adhesive layer, after sticking the pressure sensitive adhesive sheet on the stainless plate and neglecting it at 40 \*\* for 24 hours, it exfoliated and the paste residue state was observed.

O :-paste-residue-less \*\*: -- a part -- those with a paste residue x: -- generating of a paste residue -- there are many [0021]

[Effect of the Invention]Since the process of laminating a binder to an olefin system resin base material can be skipped according to the manufacturing method of the pressure sensitive adhesive sheet of this invention, the

simplification of equipment and the rate of productivity can be raised. Though a substrate is olefin system resin, the pressure sensitive adhesive sheet excellent in adhesion with an adhesive layer can be obtained.

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